Chapter 3. WRIA-Wide Actions

This Near-Term Action Agenda builds on significant salmon conservation planning and recovery work, summarized above, that has already taken place. In addition, the Action Agenda follows and builds on the *Technical Strategy for Multi-Species Salmonid Conservation and Recovery in the Green/Duwamish and Central Puget Sound Watersheds* (the Strategy), also described above. The Strategy document can be viewed on the WRIA 9 website[8]. Briefly, the Strategy describes three broad WRIA-wide goals (protect functioning habitat, ensure juvenile salmon survival, and restore access to the upper watershed) through four categories of actions:

- **Protect** functioning habitat
- **Restore** or enhance degraded habitat
- **Connect** habitat and habitat-forming processes that have been isolated by development in the watershed
- **Study** to fill data gaps and deficiencies in knowledge about salmon use and needs in the WRIA.

Twenty-six WRIA-wide actions and studies are recommended in this chapter. All are considered priority actions; they are numbered only for ease of reference. As stated in Chapter 1, the Near-Term Action Agenda is a guide to decision-making and action by local governments and other implementers. The recommendations contained herein identify the types of policies, programs, practices, and studies that have a high potential for benefiting salmon throughout all portions of WRIA 9, and can be used by local jurisdictions and organizations in setting resource protection and restoration priorities.

Chapter 4 presents additional actions, including projects specific to the five subwatersheds within the Green/Duwamish and Central Puget Sound watershed. To distinguish between WRIA-wide actions and those specific to subwatersheds, WRIA-wide actions are preceded by the abbreviation WW (for example, WW Action 1).

Although several actions address more than one of the four Strategy elements (protect, restore/enhance, connect, and study), a primary category is assigned to each.

-  A tree and stream logo identifies protection actions. Fourteen actions focus primarily on protecting currently functioning salmon habitat or processes that maintain healthy salmon habitat. The first four of these actions address identifying key resources and ways to protect them. The next two actions focus on involving the public in protecting salmon

[8] http://dnr.metrokc.gov/Wrias/9/TechnicalReports/TechnicalReports.htm (in Part III, Conclusions, Technical Strategy Working Paper).

habitat. The last eight protection actions focus on improving regulations or internal procedures that protect fish habitat.

-  A house and stream logo indicates restoration or enhancement actions. Four actions focus primarily on restoring or enhancing salmon habitat.

-  A chain logo identifies connection actions. One action recommends efforts to connect the river with its original side channels and floodplain.

-  Seven WRIA-wide studies are indicated by a calculator logo. The WRIA 9 Technical Committee recommended some of these studies; the Planning Work Group recommended others.

Protect

Actions that Address Key Resources and Ways to Protect Them

WW Action 1: Develop an inventory of currently productive fish habitat in WRIA 9 based on the Reconnaissance Assessment and additional research, and identify the habitat-forming processes associated with that habitat.

This action will provide information that allows prioritization of areas for preservation and protection to ensure that productive fish habitat (including associated streams and wetlands where appropriate) and the processes that create such habitat are protected. This action has four steps:

1. Define attributes of currently productive fish habitat and associated habitat-forming processes and develop criteria to identify areas that demonstrate such attributes.
2. Identify areas within each subwatershed that meet the criteria.
3. Evaluate existing information (including the *Reconnaissance Assessment*) and carry out field surveys to identify the most important areas of productive and functioning fish habitat.
4. Coordinate with other similar activities such as King County's effort to identify and field verify valuable habitat areas throughout the county.

- **Benefit to salmon:** Knowing which habitats are currently productive will allow targeting of protection actions to those areas that produce the most benefits and to expansion of protection around high-quality habitats.
- **Link to strategy:** Protect existing habitat.
- **Implementation:** These steps could be phased by subwatershed in the following order of priority:
  - Middle Green River and Nearshore (especially Vashon)
  - Lower Green River/Duwamish
  - Nearshore (mainland)
  - Upper Green River.

  The Technical Committee would be the lead for this action.
- **Approximate cost:** To be determined.

WW Action 2: Protect habitat and habitat-forming processes identified in Action 1 or where other efforts have identified important habitat.

The WRIA 9 Strategy emphasizes protection of currently functioning habitat and habitat-forming processes as a priority, especially in the Middle Green River and Nearshore subwatersheds. A variety of tools are available to protect habitat and associated habitat-forming processes. These tools include education, current use tax incentive programs, development regulations, acquisition

of land or easements, land lease agreements, and transfer of development rights. This action involves the following two steps:

- Develop guidelines for the level of habitat or land protection needed to maintain the essential function of key habitat types identified in Action 1.
- Evaluate and recommend alternative protection tools that are best suited to individual protection needs.

These tools should be used on a case-by-case basis to take advantage of opportunities that arise. For instance, to protect riparian buffers, purchase of development rights or incentive programs such as the Public Benefit Rating System may be suitable for protection of many functions. Protection tools may include efforts by community and environmental groups. For example, such groups may be able to educate private landowners about stewardship opportunities. Direct acquisition of land may be necessary only if other mechanisms are unworkable or not sufficiently protective. Acquisition may also be more appropriate for sites where alterations to the stream channel, such as levees or revetment relocation, are necessary. A matrix listing protection options and types of habitat or habitat functions is envisioned as an intermediate product of this action.

- **Benefit to salmon:** Protecting high quality habitat reduces or minimizes the impacts from future development on hydrology, riparian condition, water quality, and sediment transport by protecting key core habitat functions.
- **Link to strategy:** Protect functioning habitat.
- **Implementation:** The Planning Work Group, Technical Committee, individual jurisdictions, community and environmental groups, and citizens all have roles to play.
- **Approximate cost:** To be determined.

WW Action 3: Determine fish use and habitat priorities within jurisdictions.

The purpose of this action is to acquire enough information about salmon use and needs within local jurisdictions to make habitat improvements as opportunities arise. Jurisdictions within WRIA 9 should identify the salmon species and life stages that are normally present in their jurisdictions and should determine the habitat needs for those life stages. This should be done irrespective of whether these areas are identified (through WW Action 1) as the important fish use and habitat areas system-wide.

Jurisdictions should use the results of this action in the following ways:

- Identify the areas within each jurisdiction utilized by salmon or that currently provide (or with restoration and enhancement could provide) fish and riparian habitat for salmon.

- Prioritize these areas for protection or restoration, using techniques such as acquisition, conservation easements, tax incentives, or regulations (see WW Action 2).

- Educate staff of various departments about these local areas in order to work together to take advantage of routine work schedules, planned capital improvement projects, or proposed private developments that might include design to enhance habitat attributes or functions.

- Provide this information to businesses, community groups, and other stakeholders in the jurisdiction who wish to undertake fish habitat restoration or enhancement activities.

- Coordinate efforts with other jurisdictions in the WRIA.

- **Benefit to salmon:** This action would allow preservation and enhancement activities within individual jurisdictions to be targeted at the species present and their specific habitat needs. By enhancing habitat conditions within each city based on specific fish needs, overall habitat conditions in the WRIA would be cumulatively improved.
- **Link to strategy:** Protect/restore functioning habitat.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

WW Action 4: Apply existing incentives (and where necessary, develop new incentives) for protection of salmon habitat in WRIA 9.

The desired outcome of this action is to increase awareness and use of existing incentive programs. This action should occur in two phases:

1. WRIA 9 jurisdictions should evaluate their application of incentives for habitat protection.

2. Using the information developed in Phase 1, a WRIA-wide effort should be considered to enhance the effectiveness of incentives.

Incentive options to evaluate include the following:

- Enhance the use and efficacy of the King County Transfer of Development Rights Program throughout WRIA 9.[9] Help cities to set up receiving sites (where development would occur), identify properties and property owners that are good candidates for sending development rights

[9] The King County Transfer of Development Rights program transfers development density from rural areas to urban or other rural areas, providing bonus density while at the same time allowing protection of key natural resources. The use and effectiveness of this existing program could be enhanced for WRIA 9 by increasing the city/county interface, making cities and owners of sites with transfer potential aware of the program and its benefits.

(where it would be desirable to reduce development pressure), and help them to take part in the program. This could include sponsoring a workshop to facilitate information exchange.

- Educate property owners about current use assessment programs and encourage them to enroll to protect salmon habitat. Existing programs include the Public Benefit Rating System and the Timber Land Program (both administered by King County Department of Natural Resources and Parks, Water and Land Resources Division) and the Forestland Program and the Farm and Agricultural Lands Program (both administered by the King County Assessor's office).

- Publicize the King Conservation District's administration of the U.S. Department of Agriculture's Conservation Reserve Enhancement Program, which provides incentives to restore and enhance salmon habitat on private land.

- Consider using fee waivers for some conservation, restoration, and protection actions where such a waiver is not in conflict with fee-based program funding and is determined feasible by local jurisdictions.

- Enhance the awareness and use of the cost-sharing program offered through the King County Agricultural Program. This program financially assists livestock owners in employing best management practices to protect water resources.

- Publicize information about incentive programs on websites and in public displays.

- **Benefit to salmon:** Incentives are devices to encourage and reinforce land use decisions and behaviors that conserve salmon habitat, involve the public in a direct way in conservation, and instill a sense of belonging to a wider regional conservation effort.
- **Link to strategy:** Protect functioning habitat, restore degraded habitat.
- **Implementation:** Information about incentives should be available at permit counters and included in public outreach and information materials. The Planning Work Group should take the lead in implementation.
- **Approximate cost:** Varies by jurisdiction.

Actions that Involve the Public in Protecting Salmon Habitat

WW Action 5: Identify existing educational and outreach materials for promoting salmon conservation messages and make them available for use by all on a website or on loan.

The goal of this action is to ensure that appropriate, effective educational and outreach materials are available to promote salmon conservation in WRIA 9, and to coordinate these efforts with WRIA 8. The WRIA 9 Public Outreach Work Group and WRIA 9 Public Outreach Coordinator

should work with the WRIA 8 staff and Public Outreach Work Group to evaluate existing resources, determine the information needs of the diverse residents of the watershed, and develop additional materials, if necessary. The focus should be on adding to and publicizing existing resources, including the resources and ideas of community and environmental groups. New materials, if needed, should be designed so they can be easily incorporated into the environmental education and outreach efforts of WRIA 9 jurisdictions and other key watershed partners. This action will include reviewing current interpretive signage at public access areas, such as the Green River Trail, and identifying new interpretive signage needs. Two of the few areas where good public outreach materials appear to be lacking is in explaining why the WRIA needs to recover salmon habitat when salmon returns recently have been increasing and explaining that individuals must be involved in making choices and changing behavior if salmon are to be conserved.

This process should include evaluation of the effectiveness of existing WRIA 9 education and outreach tools, which include a website, tri-panel display, brochure, and PowerPoint presentation. Selected existing materials and all new materials should be made available on the website and publicized with those likely to be interested in them including school teachers, environmental groups, and local government staff. Copies should also be made available in the office of the WRIA 9 Public Outreach Coordinator.

- **Benefit to salmon:** Like all public education and outreach activities, this effort will help create a constituency of people who understand the importance of recovering salmon habitat and will support local initiatives by governments and others.
- **Link to Strategy:** Protect and restore functioning habitat.
- **Implementation:** The WRIA 9 Public Outreach Work Group and Public Outreach Coordinator should manage this action.
- **Approximate cost:** To be determined.

WW Action 6: Encourage people to contribute personally to salmon conservation through high-visibility, enticing outreach efforts focused on the theme of lawn and garden care.

Within the theme of lawn and garden care, this action will focus on the following specific topics:

- Reducing the use of chemical fertilizers and pesticides
- Increasing the use of compost to build healthy soils
- Increasing the use of native and drought-resistant plants for landscaping
- Reducing watering.

One or more of the following activities should be carried out each year in WRIA 9. Wherever possible, this should be done in cooperation with and in support of community and environmental groups in the watershed:

- Improve existing lawn and garden education efforts so that they highlight benefits to salmon.

- Offer free salmon-friendly gardening classes.

- Give away (or provide at low cost) native plant seedlings.
- Encourage jurisdictions to publicize salmon friendly lawn care and landscaping (see also WW Action 14).
- Paint murals on walls or bus shelters highlighting good yard and garden practices.
- Work with radio, TV, and other programs about gardening to promote fish-friendly landscaping practices.
- Work with the landscape industry through existing professional organizations and programs (e.g., local hazardous waste program) to participate in this campaign.

There already exist a variety of directly and indirectly related efforts to promote salmon-friendly lawn and garden care. The actions listed above are intended to add to, expand, transplant, or refine these efforts rather than starting from scratch.

- **Benefit to salmon:** Creates a constituency of people concerned about salmon recovery, who through their actions protect riparian habitat, improve water quality, and increase the flows available for fish.
- **Link to Strategy:** Protect and restore functioning habitat.
- **Implementation:** The WRIA 9 Public Outreach Work Group should oversee this action.
- **Approximate cost:** To be determined.

Actions that Improve Regulations and Internal Procedures of Jurisdictions or Organizations to Protect Fish Habitat

WW Action 7: Improve enforcement of existing regulations that protect salmon and salmon habitat.

This action seeks to prevent degradation of salmon habitat by improving enforcement of existing regulations, and it calls for jurisdictions, working individually or collaboratively with other WRIA jurisdictions, to do the following:

- Identify the root causes of enforcement issues, such as lack of funding, authority, legal support, clear direction to jurisdictional legal offices, readily identifiable fine schedules, etc.
- Educate citizens about reporting violations using existing hotlines and complaint response programs.
- Publicize significant and egregious violations.[10]

[10] The Washington Department of Ecology places newspaper notices listing violators of the Clean Water Act.

- Support and encourage the prosecution of violations.
- Where necessary, individual jurisdictions should improve enforcement with tools including but not limited to:
  - ☐ Ordinances that ensure jurisdictions have the ability to enforce regulations in a fair and equitable manner
  - ☐ Fines that are commensurate with the harm done or cost of restoration
  - ☐ Requirements that violators fully restore the habitat they degraded in violating the codes
  - ☐ An increase in enforcement staff.

- **Benefit to salmon:** Improved enforcement of existing codes will protect existing habitats and functions.
- **Link to strategy:** Protect functioning habitat and salmon life stages.
- **Implementation:** Each jurisdiction should implement, working in cooperation with other jurisdictions where desirable.
- **Approximate cost:** Varies by jurisdiction.

WW Action 8: Evaluate adequacy of existing regulations to protect riparian buffers and improve them where necessary to maintain functions that protect fish habitat.

Based upon inventory efforts from WW Action 3, WRIA 9 jurisdictions should:

- Evaluate and improve existing critical area regulations focused on fish and riparian habitat, considering the best available science.
- Encourage the use of alternatives to shoreline armoring and riprap (for example, bioengineering or soft armoring) where feasible (see also WW Action 9).

- **Benefit to salmon:** Riparian buffers provide a wide variety of functions for salmon, including protection of water quality and supplying large woody debris, shade, and food inputs. Protecting these functions is important to support and enhance salmon populations.
- **Link to strategy:** Protect functioning habitat and salmon life stages.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

WW Action 9: Promote the use of alternative shoreline protection techniques.

Encourage jurisdictions to promote the use of alternatives to traditional shoreline protection techniques, such as seawalls and riprap, through the following steps:

1. Determine habitat trends, locating critical areas for protection or restoration and identifying shoreline areas most at risk from cumulative impacts. Existing inventories, such as the Washington State Department of

Natural Resources Shore Zone Inventory Database would be useful for this effort.

2. Strengthen shoreline and sensitive area regulations as follows:
   - ☐ Require a site evaluation for each location where shoreline modifications are proposed to identify the direct, indirect, and cumulative effects of the proposed action.
   - ☐ Require evaluation of alternative techniques, such as bioengineering (Des Moines' Sensitive Area Code has language that could be used as a model).
3. Consider providing incentives, including the following:
   - ☐ Provide sources of information such as videos, fact sheets, and resource lists.
   - ☐ Provide technical assistance to contractors and homeowners (contractor and consultant referrals, free or cost-shared consultation).
   - ☐ Cost-share for some project types.
   - ☐ Consider fee waivers or streamlined permitting if determined to be feasible by the local jurisdiction.
4. Improve information about alternatives to shoreline armoring by supporting studies and pilot projects that demonstrate the effectiveness, and establish the limits, of soft or green techniques. These studies should be part of a comprehensive study program that provides critical empirical data to link shoreline armoring with direct, indirect, and cumulative changes on a local and regional scale.

- **Benefit to salmon:** Encouraging the use of alternative shoreline protection techniques protects existing habitats and may restore degraded habitats important for juvenile rearing and adult migration.
- **Link to strategy:** Protect and restore habitat.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

WW Action 10: Evaluate and improve erosion and sediment control programs to reduce sediment entering salmon-bearing streams.

The goal of this action is to improve the overall quality of erosion and sediment control programs throughout WRIA 9 in order to reduce erosion from construction sites and provide better protection to salmon streams. The action should consist of a collaborative approach by jurisdictions to review and evaluate erosion and sediment control program elements, including regulations, delegation of authority, standards and practices, adequacy of inspection, training (for inspectors and contractors), monitoring, funding, and political support. A collaborative approach

has several advantages, including sharing of expertise and developing common approaches throughout the watershed.

This action has three main steps:

1. Interview key jurisdiction staff about which erosion control program elements work well and which could be improved. Compile this information.

2. Work with key jurisdiction staff to identify potential areas to improve erosion control practices and to select areas or situations in which to pursue a stronger inspection presence and greater regional consistency in requirements. Some areas for improvement already identified include pre-construction meetings with developers to review erosion control requirements, emphasis on better erosion control for single family residence construction, and expanded training, building on material already developed by jurisdictions such as Kent and Seattle.

3. Develop a template or model erosion and sediment control program for individual jurisdictions to refer to in developing their own program.

- **Benefit to salmon:** Preventing erosion from construction sites will protect water quality and salmon spawning and rearing areas.
- **Link to strategy:** Protect functioning habitat and salmon life stages.
- **Implementation:** The WRIA will work on this action jointly. The Planning Work Group should take the lead.
- **Approximate cost:** Varies by jurisdiction.

WW Action 11: Adopt stormwater standards that protect salmon.

Local jurisdictions should work to adopt improved stormwater management standards to better protect salmon habitat in freshwater and marine environments. Standards equivalent to the 2001 Ecology Stormwater Manual should serve as a goal.

Where beneficial, jurisdictions using the same stormwater manuals could work together to apply requirements focused on salmon protection. The primary areas to evaluate are:

- Flow control standards for stream reaches
- Use of low-impact development techniques, including topsoil and tree retention, soil amendment, rainwater harvesting, and use of pervious pavement
- Enhanced water quality treatment in areas where salmon concentrate.

- **Benefit to salmon:** Improved control of stormwater prevents scouring and sedimentation of receiving waters and protects water quality. Scouring and sedimentation adversely affect salmon spawning and rearing areas.
- **Link to strategy:** Protect functioning habitat.
- **Implementation:** WRIA jurisdictions should work together. The Planning Work Group should take the lead.
- **Approximate cost:** Varies by jurisdiction.

WW Action 12: Develop programs and protocols for the maintenance of stormwater systems and facilities to reduce entry of sediment and other pollutants to salmon streams.

The desired outcome of this action is for every jurisdiction in the WRIA to implement a program for the regular inspection and maintenance of stormwater facilities, both public and private. Jurisdictions should examine their current programs to ensure their adequacy and make improvements where necessary. The use of incentives to promote better private maintenance response is encouraged (SeaTac and King County have incentives that could be used as examples).

- **Benefit to salmon:** Maintenance and inspection will allow proper functioning of facilities and capture sediment and flood waters before they reach salmon streams, protecting spawning and rearing habitat.
- **Link to strategy:** Protect functioning habitat.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

WW Action 13: Review road maintenance practices and adopt written operating procedures to reduce potential impacts to salmon and salmon habitat.

Each jurisdiction should review its road maintenance practices in light of the program developed by the Tri-County Endangered Species Act Response and make adjustments where warranted. Jurisdictions should consider the methods in adjacent jurisdictions as part of this evaluation. If road maintenance best management practices are not currently in writing, each jurisdiction should record them and develop (or adopt) a manual to guide day-to-day operations and for staff training and reference. WRIA 9 jurisdictions are encouraged to develop shared training opportunities for all staff involved in road maintenance, repair, and construction.

- **Benefit to salmon:** Improved practices for maintenance of roads will improve water quality and reduce the harmful effects of sediment and other contaminants.
- **Link to strategy:** Protect functioning habitat.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

WW Action 14: Review parks and grounds maintenance procedures and adopt written best management practices that protect salmon and salmon habitat.

Each jurisdiction should review and update its grounds maintenance practices in light of the programs developed by the City of Portland and others and make adjustments where warranted. If grounds maintenance best management practices are not currently in writing, each jurisdiction should record them and develop (or adopt) a manual to guide day-to-day operations and for staff training. WRIA 9 jurisdictions are encouraged to develop shared training opportunities for all staff involved in grounds maintenance. Jurisdictions should consider using public parks as training or demonstration sites for public education on landscaping maintenance procedures

(see also WW Action 6). When evaluating landscape or planting options as part of park planning efforts (e.g., master plans, stewardship plans), the potential impacts of maintenance activities on salmon should be considered. Jurisdictions also should consider encouraging the use of best management practices for golf courses as laid out in King County's *Best Management Practices for Golf Course Development and Operation* (January 1993)[11], especially for municipally operated golf courses.

- **Benefit to salmon:** Improving grounds maintenance practices should protect water quality through preventing discharge of sediment, pesticides, and other pollutants.
- **Link to strategy:** Protect functioning habitat.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

[11] The Golf Course Superintendents Association of America maintains a helpful webpage with links to turf management information. See http://www.gcsaa.org/. In addition, the book *Golf Course Management and Construction: Environmental Issues*, edited by James Balogh and William Walker (1992, Lewis Publishers, Inc.), contains helpful information about pesticides and fertilizer transport and impacts that would help in preparing an environmentally protective golf course management plan.

Restore or Enhance

WW Action 15: Develop a comprehensive, WRIA-wide process to identify, develop, and prioritize projects that benefit salmon and carry out the WRIA 9 Strategy.

Develop a comprehensive process to identify projects WRIA-wide, considering acquisition, restoration, removal of passage barriers, and other project types for all areas of the watershed and pursue those projects that provide the most benefits and that can be initiated within the near term (2 to 4 years) or as part of the Comprehensive Salmon Conservation Plan. This process should incorporate the results of WW Actions 1 and 3, as well as other work, to identify key habitat areas and functions. A rolling six-year time horizon is recommended for planning purposes, but priorities should be reestablished annually for Salmon Recovery Funding Board and King Conservation District funding and as planning and technical work proceeds.

Projects that have already been developed are discussed in Chapter 4. This action would synthesize and analyze these projects and develop others to better carry out key aspects of the Strategy.

Part of this action should identify those projects that are suitable for implementation by community and environmental groups. These opportunities may be either small-scale, stand-alone projects or part of larger projects involving government partners.

- **Benefit to salmon:** A comprehensive project planning process will allow the WRIA to focus its resources on projects that are most valuable for salmon.
- **Link to strategy:** Protect and restore functioning habitat.
- **Implementation:** The Planning Work Group should take the lead and involve the Technical Committee to implement this action.
- **Approximate cost:** To be determined.

WW Action 16: Create combined naturalist and stewardship activities across WRIA 9.

The goal of this action is to create a cadre of volunteers that become stewards of sites in WRIA 9, providing a powerful hands-on experience while implementing high priority on-the-ground salmon habitat projects. The program should build upon, and go beyond, the success of existing community and environmental groups and the Beach Naturalist Program, using the following steps:

- Identify a limited number (3 to 5) of focus areas in the watershed where the WRIA can bring together a local school, businesses, and/or existing environmental or community groups to restore or protect salmon habitat. Look for areas where the community has an existing interest (e.g., water quality concern, restoration project, parks, etc.) that can be built upon to increase community participation.

- Educate students and other citizens about natural resources through the Seattle Aquarium Mobile Field Lab, King County Interpretive Programs Office, and other experts.

- Involve students, existing environmental and community groups, local residents and businesses, and local government stewards (King County, Seattle, Tukwila, etc.) in stewardship of the focus area. The program could be integrated with school district curricula and existing efforts.

- Provide assistance to students, environmental or community groups, local residents, and businesses who want to foster stewardship activities both inside and outside the focus areas. Assistance could be directed toward obtaining grants, initiating community outreach efforts, and participating in environmental education activities. Existing community and environmental groups may be helpful in providing this assistance to new efforts or groups. Such partnerships will serve to strengthen citizen-to-citizen linkages that make conservation efforts relevant and effective and foster a sense of watershed community.

  - **Benefit to salmon:** Creates a constituency of people who understand the importance of recovering salmon habitat and who will share that understanding with others to create broad support for salmon friendly actions in the community.
  - **Link to Strategy:** Restore functioning habitat.
  - **Implementation:** The WRIA 9 Steward/Public Outreach Coordinator would manage this program.
  - **Approximate cost:** $55,000 per year, initially funded through King Conservation District fee allocation.

WW Action 17: Encourage the restoration of riparian buffers.

Encourage the restoration of riparian functions in areas of the mainstem, tributaries, and the nearshore where natural buffer functions have been degraded or eliminated. This effort involves the following actions:

- Work with existing groups to provide information and incentives for landowners to replant native shrubs and trees.

- Acquire easements of title interests in riparian buffers, and replant buffers where incentive programs are insufficient.

- Encourage the use of the Conservation Reserve Enhancement Program (see also WW Action 4 and Middle Green River Action 2).

- Encourage projects that set levees back from the shoreline to create areas of riparian habitat.

- Negotiate with the U.S. Army Corps of Engineers to allow the Green River Flood Control Zone District and King County Rivers Program to establish limited vegetation on certified dikes, levees, and revetments in key chinook salmon habitat areas.
- Sponsor local riparian restoration projects for community volunteers, perhaps applying for grants to support local restoration activities.
- Encourage local jurisdictions to aggressively control noxious weeds in riparian buffers.
- Encourage maintenance and monitoring of local riparian restoration projects to ensure their success.

- **Benefit to salmon:** Riparian areas provide important functions for salmon, including shade, large woody debris, nutrients, and protection of water quality.
- **Link to strategy:** Restore functioning habitat.
- **Implementation:** The Planning Work Group and local governments all have lead roles.
- **Approximate cost:** To be determined.

Note that a wide variety of riparian enhancement projects also are planned for the WRIA in several subwatersheds. More information about these projects is provided in Chapter 4.

WW Action 18: Implement Phase 1 of the Ecosystem Restoration Project.

The local jurisdictions of WRIA 9 should continue to support the Green/Duwamish Ecosystem Restoration Project during the pre-construction engineering and design phase and as the construction phase begins in 2003. This includes working to promote and secure federal funding for design and construction, as well as working regionally and with local jurisdictions to provide the local cost-share.

The U.S. Army Corps of Engineers (Corps) has been working with local jurisdictions, the Muckleshoot Indian Tribe, and state resource agencies since 1995 on the Green/Duwamish Ecosystem Restoration Project. The reconnaissance study, feasibility study, and programmatic environmental review phases are complete, and the pre-construction engineering and design phase has begun. The entire Ecosystem Restoration Project consists of 45 restoration sites throughout the Green/Duwamish watershed that will be recommended for construction over the next 10 years. Phase 1 includes completion of design and construction for the first 20 sites between 2002-2006.

For the year 2002, the WRIA 9 Forum committed to providing local matching funds for the design of the Phase 1 projects. King County has recently signed an agreement with the Corps to act as the lead non-federal sponsor for the design portion of the Ecosystem Restoration Project. It is anticipated that the construction portion of the project will be co-sponsored by local jurisdictions and the Corps. Specific Phase 1 ecosystem restoration projects that are of benefit to chinook and bull trout are shown in Chapter 4 in the following subwatershed sections:

- Upper Green River Subwatershed, Table 5
- Middle Green River Subwatershed, Table 11
- Lower Green River Subwatershed, Table 18
- Elliott Bay/Duwamish Subwatershed, Table 25.

- **Benefit to salmon:** Most of the ecosystem restoration projects will protect and restore habitat that benefits chinook and other salmon species.
- **Link to strategy:** Protect and restore functioning habitat.
- **Implementation:** The Corps is the lead, various local governments are local sponsors.
- **Approximate Cost:** $3 million for Phase 1 Preliminary Engineering and Design; $113 million for design and construction over 10 years. The local cost share is 25 percent.

Connect

WW Action 19: Evaluate fish passage barriers at the local jurisdiction level.

Each jurisdiction should evaluate culverts and other potential passage barriers to salmon migration within its boundaries, and then assess which barriers are most important to remove based on the suitability of potential habitat that would be opened. It is recommended that barriers that would open potential habitat for chinook salmon be addressed first. This action should involve the following steps:

- Use the WRIA 9 *Habitat Limiting Factors and Reconnaissance Assessment* report to identify known fish passage barriers[12]. Augment this information with field surveys where needed.
- Determine habitat quality upstream of barriers. The Pierce Conservation District has developed protocols that may be helpful.
- Add the most important projects to city and county capital improvement project lists.
- Look for other opportunities to remove barriers, such as capital improvement projects, development mitigation requirements, etc.
- This action refines and builds on WW Action 3.

- **Benefit to salmon:** Removal of high-priority fish passage barriers will open up additional habitat to salmon, providing important habitat complexity and diversity.
- **Link to strategy:** Connect habitat features to improve amount of habitat available to salmon.
- **Implementation:** Each jurisdiction should implement.
- **Approximate cost:** Varies by jurisdiction.

[12] Note that Newaukum and Soos Creek information is incomplete.

Study

The studies discussed below were selected to fill the most pressing data gaps identified in the *Reconnaissance Assessment*. Beginning these studies quickly is a priority. In addition, it is important to be aware of other baseline information and research efforts in the watershed and the state, and to build on them to the extent possible. These studies (and some of the WRIA-wide actions) need to be coordinated with other efforts in the larger Puget Sound watershed and the state, particularly with respect to standardizing methods and protocols.

WW Study 1: Monitor habitat restoration projects to determine fish response and apply the information to future projects.

The goal of this study is to monitor in-stream restoration sites to assess fish response to the restoration over time so that future projects can be more effective. This action involves the following steps:

- Project proponents should identify clear objectives related to salmon response.
- The WRIA 9 Technical Committee, or a WRIA-sponsored consultant, should develop a WRIA-wide monitoring approach to guide the measurement of fish response for selected in-stream habitat restoration projects. This approach should be consistent with the Washington State Department of Fish and Wildlife's new monitoring guidance[13].
- The WRIA 9 Technical Committee, or a WRIA-sponsored consultant, should review monitoring plans required by funding agencies. If funding agencies do not require salmon-specific elements, the Technical Committee should recommend additional funding and appropriate salmon-centered monitoring.
- The WRIA should develop a repository for monitoring data and ensure the data are entered in an efficient and effective manner. The WRIA should encourage data sharing and a high level of accessibility to data.

- **Benefit to salmon:** Over time, monitoring information will enable the WRIA to determine which in-stream actions have the most benefit for salmon. Stakeholders will be able to focus their resources to be more effective in improving salmon habitat.
- **Link to Strategy:** Study to restore functioning habitat.
- **Implementation:** Lead to be determined. Coordination with the WRIA 9 Technical Committee is strongly recommended.
- **Approximate cost:** To be determined.

[13] It is anticipated that the U.S. Army Corps of Engineers will, in the near future, develop monitoring guidance for its Ecosystem Restoration Project.

WW Study 2: Identify which factors are limiting to salmon populations by subwatershed.

Although the *Reconnaissance Assessment* identifies the important factors of salmon decline in WRIA 9, the extent to which each is a limiting factor (or creates a bottleneck that results in under-utilization of other resources) is not identified. The goal of this action is to develop a working model of how the various factors of decline interact and pursue studies and investigations to determine which factors are limiting. In the near term, the focus of this action is on listed species (chinook salmon and bull trout), but it should expand in the longer term to include all salmon species.

- **Benefit to salmon:** This information will allow the WRIA to target its efforts to address those problems that most limit salmon production.
- **Link to Strategy:** Study to restore functioning habitat, ensure adequate juvenile salmon survival.
- **Implementation:** Lead to be determined. Coordination with the WRIA 9 Technical Committee is strongly recommended.

WW Study 3: Develop a research framework for assessing juvenile salmon survival in WRIA 9.

This action is related to WW Study 2. The goal of this study is to determine the effects of the significant habitat modifications in WRIA 9 on juvenile salmon. A variety of agencies are conducting studies on juvenile salmon survival, particularly in the Lower Green River, Elliott Bay/Duwamish, and Nearshore subwatersheds. The WRIA 9 Technical Committee should oversee development of a research framework for these studies to identify aspects that other agencies are not yet addressing. The WRIA then can work to fill the gaps in the study framework, eventually answering the important question of juvenile salmon survival rates.

- **Benefit to salmon:** The results of this work will guide restoration and protection actions in the future, allowing the WRIA to enhance juvenile salmon survival.
- **Link to Strategy:** Study to ensure adequate juvenile salmon survival.
- **Implementation:** The WRIA 9 Technical Committee should oversee this work. The City of Seattle will manage the project directly.
- **Approximate cost:** $50,000

WW Study 4: Support the Green/Duwamish Water Quality Assessment.

WRIA 9 supports the Green/Duwamish Water Quality Assessment, a King County project focused on monitoring and modeling current and future water quality conditions in the Green/Duwamish watershed. A portion of the project is targeted towards providing information to the WRIA 9 planning process and will help to identify where water quality is or may be a factor of decline for salmon. WRIA 9 encourages the expansion of the project to address water quality data gaps identified in the *Reconnaissance Assessment* report, including:

- Additional spatial data on aquatic insects as measured by the benthic index of biotic integrity
- Data collection on trace organics (e.g., pesticides, PAHs, phthalate esters)
- Sediment budget and transport.

WRIA 9 jurisdictions should support outside funding, if needed, to provide the means to address the data gaps not currently included in the Green/Duwamish Water Quality Assessment.

- **Benefit to salmon:** Identifying areas where water quality adversely affects salmon will allow the WRIA to address these problems.
- **Link to Strategy:** Study to restore functioning habitat.
- **Implementation:** King County should work with the WRIA 9 Technical Committee and the newly formed Green Water Quality Assessment Technical Work Group that includes representation from WRIA 9 cities.
- **Approximate cost:** To be determined.

WW Study 5: Conduct an assessment of large woody debris recruitment in WRIA 9.

The goal of this study is to determine to what extent, if any, current rates of large woody debris recruitment limit habitat formation in the Green/Duwamish River. The study will begin with an assessment of the following two aspects of large woody debris recruitment in the Green River:

- The potential for future recruitment of standing trees as large woody debris within the Green River riparian zone
- The rate and frequency at which this recruitment would occur.

A workshop with ecologists and habitat experts in WRIA 9 should identify the scope of this project. This study should involve the analysis of existing information as well as the collection of additional field data where needed.

- **Benefit to salmon:** Understanding aspects of large woody debris recruitment in WRIA 9 will help policy makers craft more effective buffer regulations and scientists develop better habitat projects.
- **Link to Strategy:** Study to restore habitat and habitat-forming processes.
- **Implementation:** The WRIA 9 Technical Committee should oversee this project.
- **Approximate cost:** $30,000

WW Study 6: The WRIA 9 Planning Work Group, WRIA 9 Technical Committee, Central Puget Sound Water Suppliers Forum, and other appropriate agencies should work together to understand and evaluate the water budget for people and fish in the WRIA.

The purpose of this work is to determine the sources of flow and flow diversion in the Green/Duwamish River to inform better management decisions regarding flow regulation and solutions to flow problems.

This action will include the following main tasks:

1. The Planning Work Group and the Technical Committee should develop an appropriate scope of work and identify other organizations and agencies that need to be consulted or included in the work.

2. Meet with other agencies, including water suppliers, to further develop the scope of work.

3. Develop an implementation plan and identify funding to complete the agreed-upon work.

- **Benefit to salmon:** This information could highlight areas where flows are a concern, enabling the WRIA to address them, or it could determine that the future water supply will not support certain habitat improvements, emphasizing the need to use limited resources wisely.
- **Link to Strategy:** Study to restore habitat and habitat-forming processes.
- **Implementation:** Lead to be determined. Coordination with the WRIA 9 Technical Committee is strongly recommended.
- **Approximate cost:** To be determined

WW Study 7: Develop mechanisms to increase collaboration and coordination in scientific work directed toward salmon recovery.

The desired outcome of this study is to develop strategies to reduce duplication and redundancy and increase the effective use of resources in scientific studies that will support salmon recovery actions.

- Develop opportunities to regularly share scientific information across jurisdictions, across levels of government, and with citizen groups that are involved in salmon conservation in WRIA 9.

- Seek to learn from the experiences of other WRIAs engaged in salmon conservation in the Puget Sound area.

- Develop a periodic forum for coordinating scientific work across entities doing research and/or monitoring in the WRIA to minimize duplication, share information, and effectively use available funds.

- **Benefit to salmon:** Coordination of scientific work will increase our ability to develop scientifically supportable actions with our limited salmon recovery dollars.
- **Link to strategy:** Coordinate studies to protect and restore habitat and habitat forming processes.
- **Implementation:** WRIA 9 Technical Committee
- **Approximate cost:** Not identified, but additional funds for coordination events will be required.